Solar Market Transformation Overview

SETP Peer Review | May 24, 2010

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SETP Budget – 10 Year History

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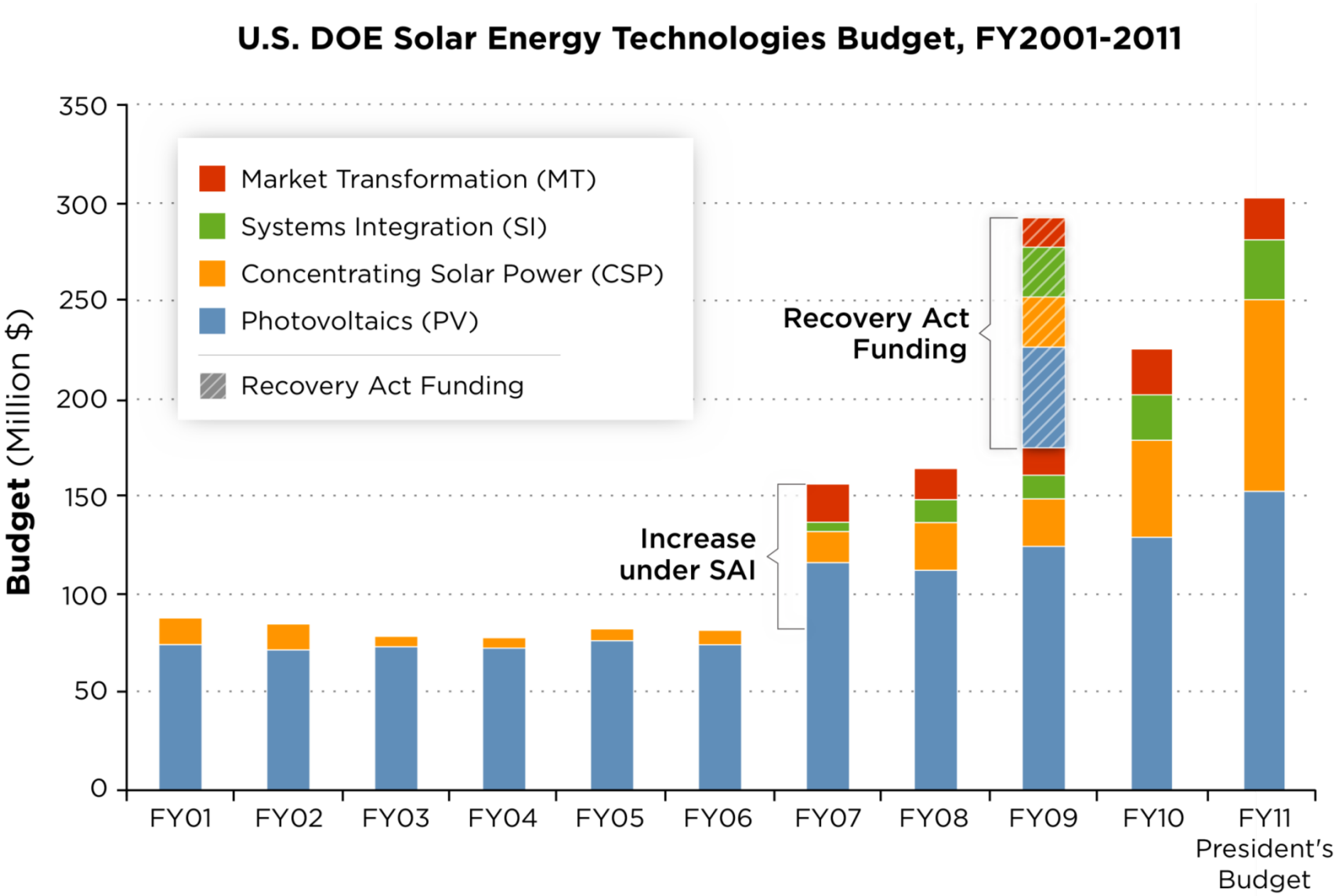
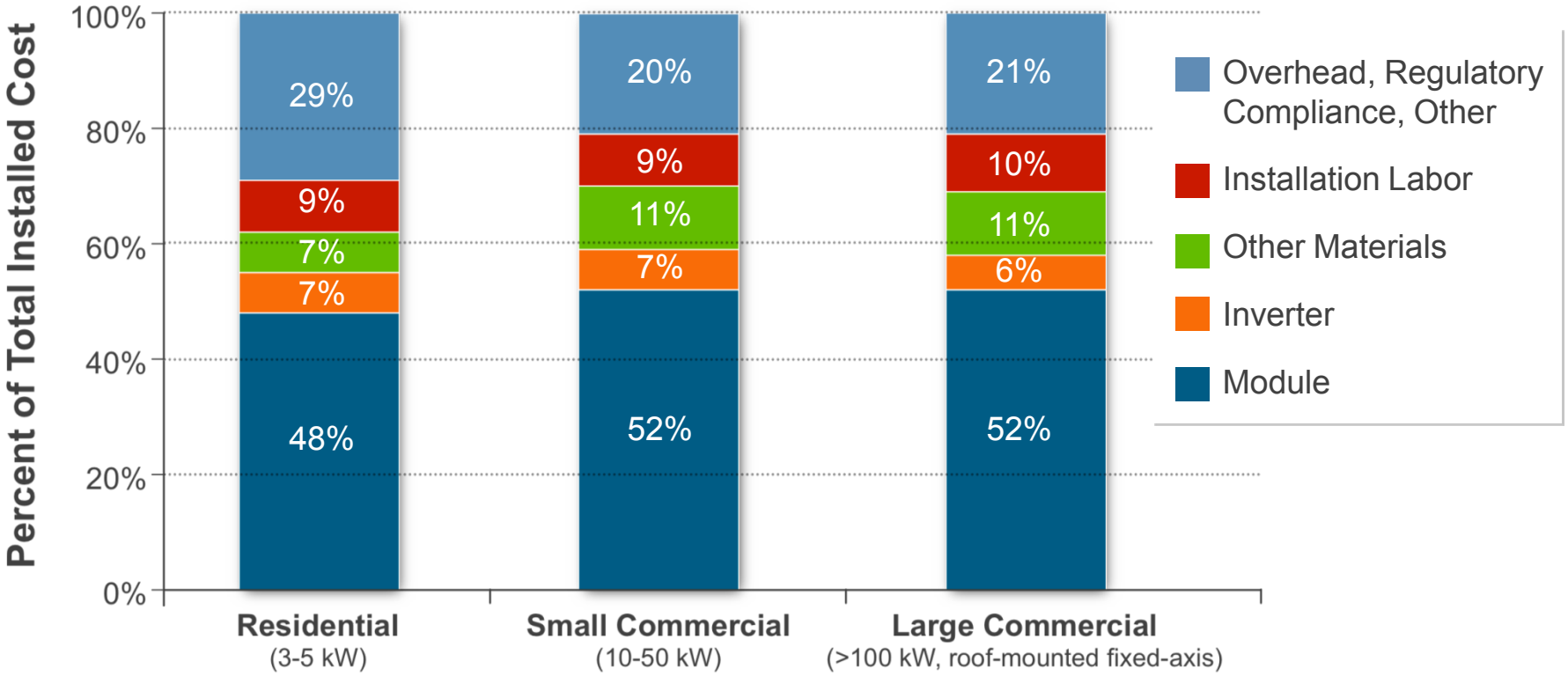


Barriers to Widespread Adoption

- Shortage of information about solar technologies and little consumer awareness
- Inconsistent interconnection, net metering, and utility rate structures and practices for solar systems
- Inadequate codes and complex and expensive permitting procedures
- Large-scale siting and permitting issues
- Lack of transmission
- Inconsistent and insufficient state and local financial incentives and financing mechanisms
- Limited education for and insufficient numbers of trained and experienced personnel and services

A Closer Look at PV Costs

Labor, permitting, interconnection, and other regulatory costs are a significant fraction of the total cost of a PV system



Source: Lawrence Berkeley National Laboratory, 2009

Solar America Cities is a U.S. Department of Energy Program to increase the use and integration of solar energy in communities across the U.S.

SOLAR AMERICA CITIES™

25 Solar America Cities Partnerships

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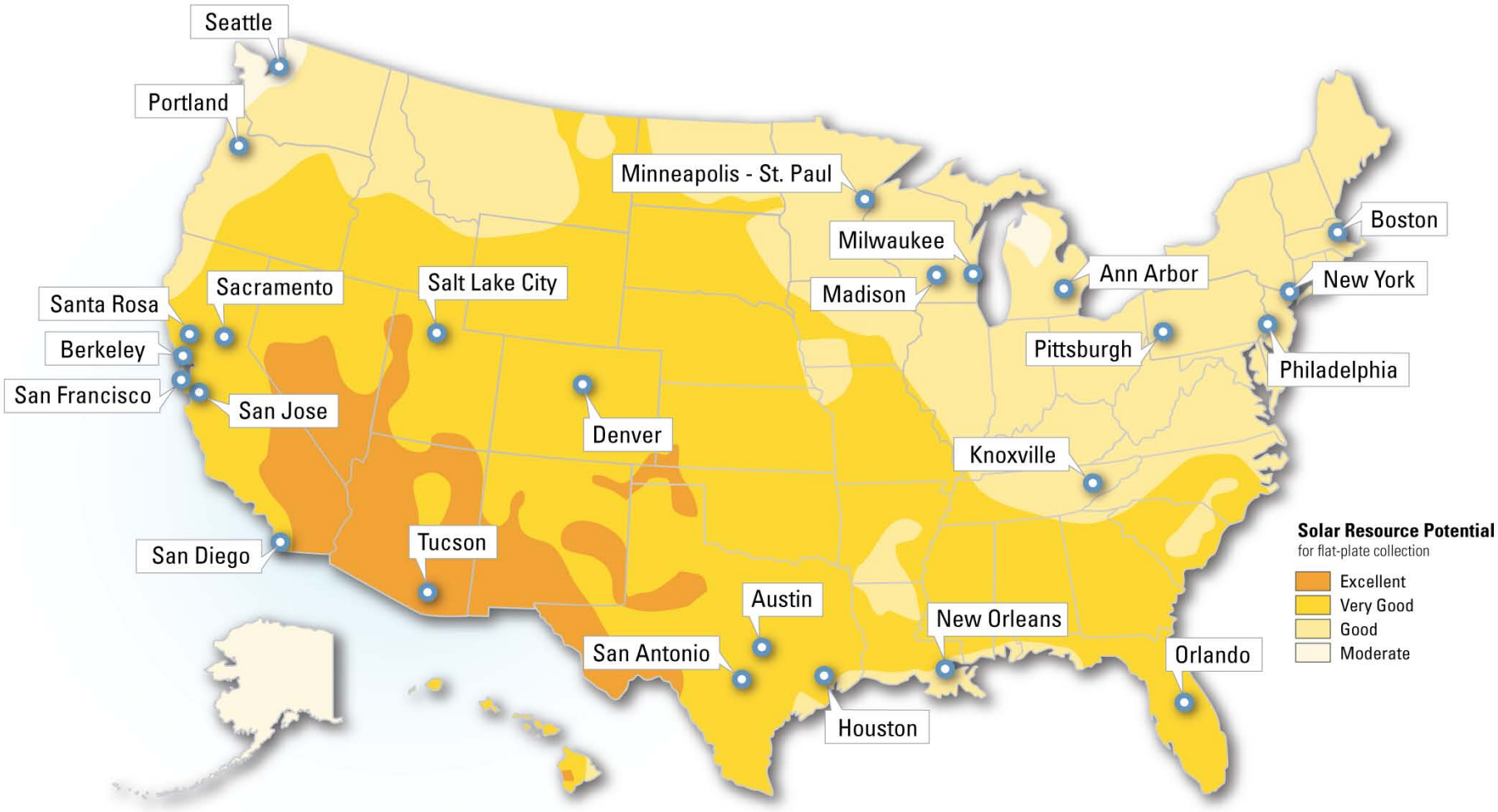

Solar America Cities: 25 Partnerships

- **Goal:** Develop comprehensive city-wide approaches for increasing solar energy use in some of the nation's largest cities
- Selected 25 cities over 100,000 based on commitment to a comprehensive approach to solar deployment
- Each city receives $200k in financial assistance, $250k in tailored technical assistance from multi-institutional tiger teams

Solar America Cities Special Projects

$10M in Recovery Act funding

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Support local government innovation and bring successful pilot policies and programs to scale for replication across the nation

PROJECT CATEGORY	CITY	PROJECT TITLE
Affordable Housing	San Diego	Affordable Housing Analysis
	San Francisco	Debt-Financed SHW Retrofits for Affordable Housing
Data Monitoring	New York City	Smart Solar City Data Acquisition System
Demonstration Projects	Milwaukee	SWH Demonstration Projects and Best Practices Manual
	Minneapolis - Saint Paul	Solar for District Heating and Cooling
Emergency Preparedness	Boston	Solar Evacuation Route
	San Diego	Solar Fire Shelters
Financing	Madison	MadiSUN Community Solar Financing
	Milwaukee	Property Assessed Clean Energy Financing
	New Orleans	Third Party Solar Tax Credit Implementation
		Sustainable Energy Financing District Implementation
	New York City	Community Solar Financing
	Portland	Neighborhood-Based Volume Solar Purchasing
		Residential Solar PPA Model for Utility-Bill Financing
	Salt Lake City	Financing Options for Mid-Large Scale Systems
		Solar Rebate Program Expansion and Third Party PPA Legal Analysis
	San Francisco	Commercial Solar PPA Model
	San Jose	Property Assessed Solar Financing through Joint Powers Authority
		Solar Loans for City Staff
		QECBs for Revolving Solar Loan Fund
	Seattle	Community Solar Financing through Municipal Utility
	Tucson	Creative Financing for Municipal Solar Installations

PROJECT CATEGORY	CITY	PROJECT TITLE
Industry Recruitment	Milwaukee	Solar Hot Water Business Council
Outreach	Berkeley	Smart Solar Regional Expansion and Solar Map Enhancements
	Madison	Target Marketing Solar to Business
		Solar Business Center
	New York City	Smart Solar Virtual Community
	Portland	Solar Now! Regional Outreach Campaign
	San Francisco	San Francisco Sustainable Financing Program Marketing
	San Jose	Green Vision Education and Demonstration Center
	Santa Rosa	Clean Energy Advocate
	Tucson	Solar One Stop Shop
Permitting & Codes	Portland	Neighborhood-Scale Distributed Energy Systems
	San Jose	Streamlined Regional Permitting Process
	Tucson	Integrating Solar into Green Building Codes and Infrastructure Planning
Schools	Austin	Solar Curriculum Development and School Demonstration Projects
	Milwaukee	Solar School Swap
	San Francisco	Solar Financing for Public Schools
Workforce Development	San Jose	Solar Train the Trainer Internship Program
		Solar Career Training for At-Risk Youth

Resources on the Solar America Cities Website

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Recent publications and tools:

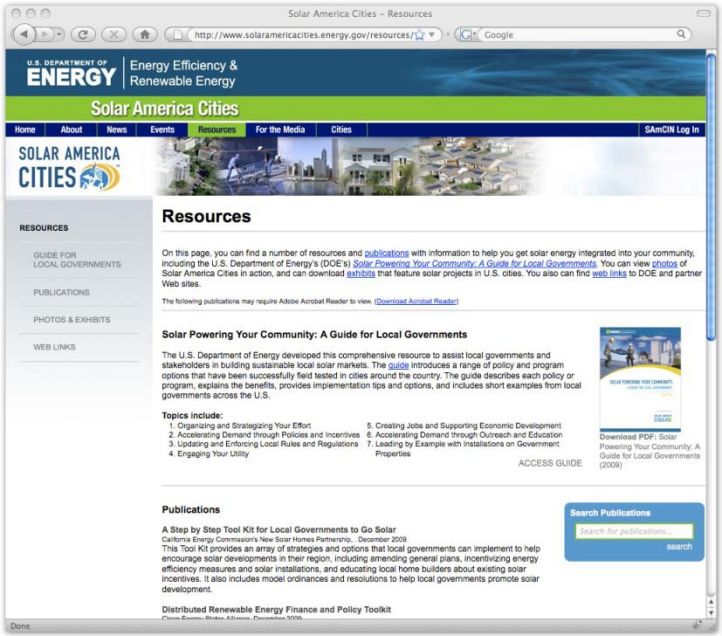
- Report: Interconnecting PV to Network Grids
- Report: Review of Web-based Solar Mapping Tools
- Report: The Impact of Utility Rate Structures on PV System Value – a San Diego Case Study

Upcoming publications and tools:

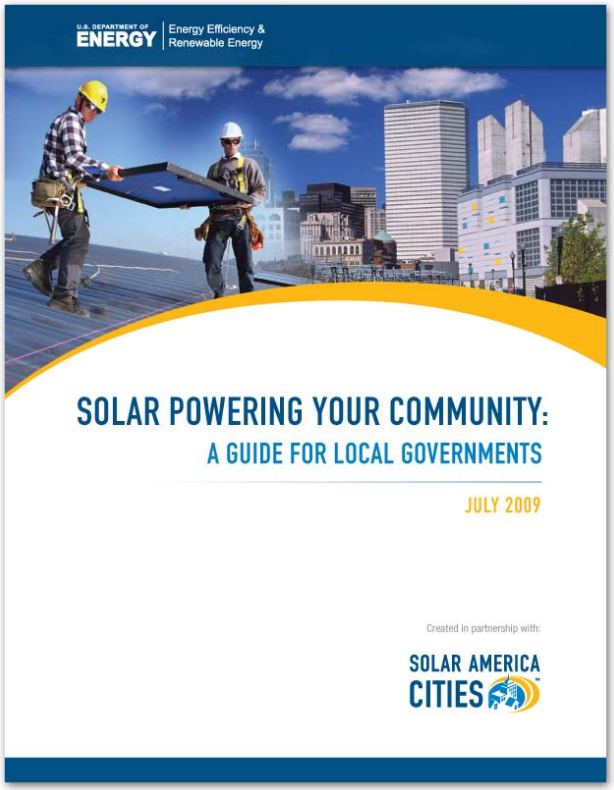
- Status reports on PACE and Community Solar Financing Models
- Report: Incorporating Solar into Emergency Management Infrastructure
- Report: Assessing Solar Economic Development Opportunities in your City
- Report: Streamlining Solar Permitting through Standardized Structural Design
- PV / SHW Rooftop Optimization Tool

www.solaramericacities.energy.gov

- Read about the program
- Get the latest news and events
- Search the publications database
- See what cities are working on



Solar Powering Your Community: A Guide for Local Governments



Provides policy and program descriptions, implementation tips and options, and real life examples in areas of:

- Organizing and strategizing efforts
- Accelerating demand through policies and incentives
- Updating and enforcing local rules and regulations
- Engaging utilities
- Creating jobs and supporting economic development
- Accelerating demand through outreach and education
- Leading by example with installations on government properties

www.solaramericacities.energy.gov/resources

Solar America Cities Technical Outreach

$10M over 5 years beginning in FY10

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- **Goal:** Provide information on solar best practices to thousands of local governments across the nation
- Leverages investment in 25 Solar America Cities and distributes lessons learned to other communities
- Selections made in April 2010; Launch expected by July 2010
  - International City-County Management Association (ICMA), in partnership with APA and NARC
  - ICLEI-Local Governments for Sustainability, in partnership with IREC, NCSU, SEPA, Meister Consultants Group, The Solar Foundation
- Activities may include regional conferences, new publications, and targeted in-person presentations

Workforce Development

A well-trained solar workforce is necessary to ensure:

Quality installations

Cost reductions

Consumer confidence

To support solar workforce training, the U.S. DOE launched a nationwide program in October 2009

Solar Instructor Training Network

$27M over 5 years (includes $10M in ARRA funding)

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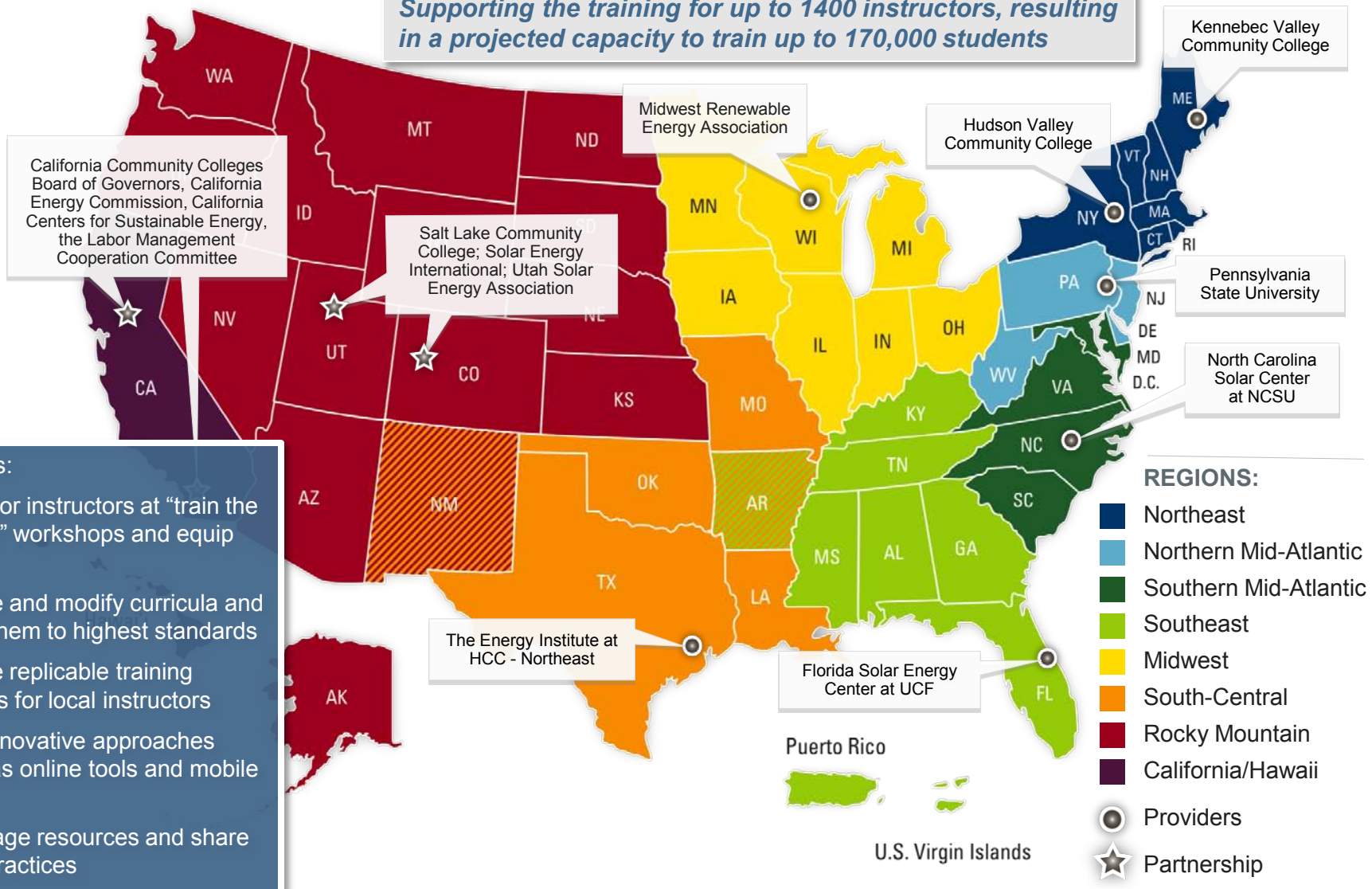
Supporting the training for up to 1400 instructors, resulting in a projected capacity to train up to 170,000 students



Activities:

- Sponsor instructors at "train the trainer" workshops and equip labs
- Create and modify curricula and align them to highest standards
- Create replicable training models for local instructors
- Use innovative approaches such as online tools and mobile labs
- Leverage resources and share best practices

Accreditation and Certification

IREC is the North America Licensee for ISPQ Accreditation

- Certifies master trainers and instructors
- Accredits training programs

NABCEP is an ANSI-accredited organization which administers …

- Entry Level Program
- Solar PV Installer Certification
- Solar Thermal Installer Certification
- Technical Sales Certification (*coming 2010*)

Request for Information on Certification and Accreditation activities open until May 31st

State Technical Outreach

Primary Objectives:

- Build relationships with and among state decisionmakers responsible for enacting policies, programs and plans that address barriers to solar deployment and serve as key drivers for solar technology market transformation.
- Provide these decisionmakers with the most current data on solar technologies and best practices so that they can make informed solar policy and program decisions.

State Technical Outreach

Key Activities:

- Educate staff at stakeholder organizations so that they are equipped to better inform state decisionmakers.
- Work directly with state utility commissions through dedicated Technical Assistance Partnerships to address issues of concern such as integrating high levels of PV on a network grid and developing complex policy mechanisms such as feed-in tariffs.
- Assist and provide support to MT activities in the other SETP Technology Program Areas including engagement in state and regional renewable energy development and transmissions planning processes.
- *New Funding Opportunity*: Expand state outreach activities to identify and address the barriers that exist in specific regions including regions that are at the beginning stages of solar market development such as the Southeast.

Utility Technical Outreach

Primary Objective:

Deliver key technical and informational assistance to utilities to promote their acceptance and use of solar.

Key Activities:

- Develop new business cases for solar.
- Provide the most current information on solar technologies working directly with the PV and CSP teams.
- Disseminate innovative solar program design information to utilities.
- Engage directly with utilities on the potential operational impacts of increased levels of variable solar generation on the transmission system and understanding how higher levels of distributed PV act on the distribution system.
- *New Funding Opportunity*: Expand efforts to work more specifically with municipal utilities and electric cooperatives

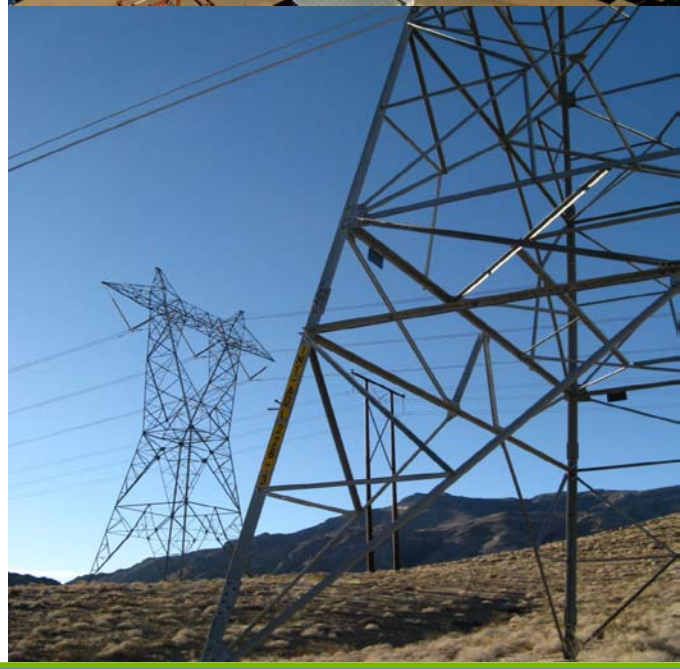
Large-Scale Solar Integration

Primary Objective:

Engage in multi-stakeholder transmission planning organizations and processes to deliver key technical and informational assistance to utilities, regulators and other key stakeholders to ensure solar is included in these activities.

Key Activities:

- Initiate a dialogue on how to include solar and other renewables in Western U.S. transmission planning
- Engage in existing transmission planning processes in the Western U.S., e.g. TEPPC, CREPC, and WREZ, to ensure that large-scale solar (CSP and PV) is considered as part of the generating portfolio.
- *New Activity:* Expand activities in this area to engage directly with utilities on transmission level integration issues for solar. (Coordinated with Systems Integration Team.)



Large-Scale Solar: Environmental Impact

Primary Objective:

Identify and address ways to decrease and/or mitigate the potential impacts of large-scale solar project development.

Key Activities:

- Conduct Life Cycle Analysis assessments for parabolic trough and power tower technologies.
- In coordination with the Bureau of Land Management, support the development of the Programmatic Environmental Impact Statement for solar development in the Southwest.
- Assess ways to decrease water use in CSP generating technologies.
- *New Activity:* Develop and conduct trainings on solar energy technologies, project development and environmental impacts for Interior Department field office staff at the BLM, FWS, NPS and others.

Technical Assistance

Government Solar Installation Program

- Work with the Federal Energy Management Program (FEMP) to provide technical assistance to federal agencies with the goal of overcoming barriers to the installation of solar systems at their facilities.
- Assist the General Services Administration (GSA) with Recovery Act-funded PV installations on 32 buildings totaling 12 MW
- *In development*: How-to Guide for Federal Solar Projects

Solar America Showcases

- Provide technical assistance to replicable, large-scale, high-visibility solar installation projects
- Projects include military housing, low-income housing, school districts, convention centers, and mixed-use developments

MT Analysis and Tools

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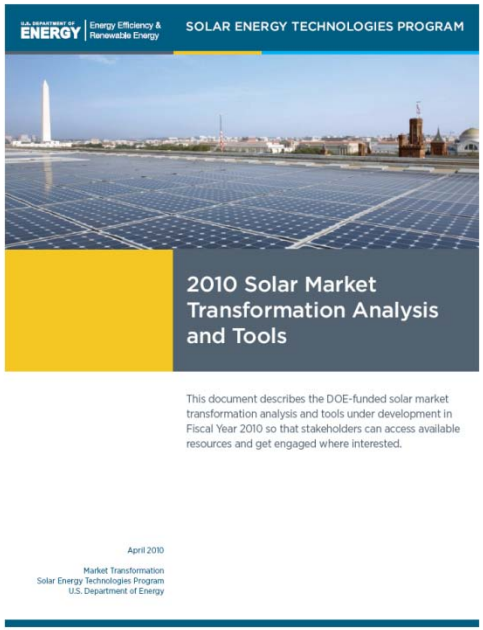
Lab Projects

- Open PV Mapping Database
- Jobs and Economic Development Impacts tool (JEDI 2.0)
- Utility Rate Open Platform Database Development
- Feed-in Tariff collaborative
- RE Project Finance Webview



New Funding for 2010: Solar Regional Analysis Network

- Goals
  - Expand trusted regionally-focused analysis relevant to distinct markets
  - Grow the base of institutions examining solar implementation by reaching out to universities
  - Expand areas of inquiry to support long term market transformation (e.g. sociology, architecture, law, marketing) and encourage interdisciplinary work.
- Funding
  - Up to $10-12M total DOE funding projected over three years for 3-5 awards

Thank You

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